B2 cont'd.

A1 cont.

a detecting circuit configured to detect an earth fault in the rotating field circuit.

29. A machine as claimed in claim 28, wherein:

a potential of the first semiconducting layer being substantially similar to a potential of the conductor.

30. A machine as claimed in claim 28, wherein:

the second semiconducting layer is arranged to form a substantially equipotential surface surrounding the conductor.

sub B3

31. A machine as claimed in claim 30, wherein:

the second semiconducting layer is connected to a predetermined potential.

32. A machine as claimed in claim 31, wherein:

said predetermined potential is earth potential.

33. A machine as claimed in claim 28, wherein:

at least two adjacent layers of the machine winding have substantially a same coefficient of thermal expansion.

Sub B4

34. A machine as claimed in claim 28, wherein:

the conductor comprises a predetermined number of strands, at least some of said predetermined number of stands being in electrical contact with each other.

35. A machine as claimed in claim 28, wherein:

each of said first semiconducting layer, said solid insulating layer, and said second semiconducting layer is firmly joined to adjacent layers along substantially a whole contact surface.

36. A machine as claimed in claim 35, wherein:

A' cont.

said layers are arranged to adhere to each other even when the electric winding is bent.

Sub B5

37. A rotating electric machine having a rotating field circuit, and configured to be directly connected to a distribution or transmission network, comprising:

a winding formed of a cable, said cable having

a current carrying conductor having a plurality of strands,

an inner semiconducting layer arranged around the current carrying conductor,

an insulating layer of solid insulating material arranged around said inner semiconducting layer, and

an outer semiconducting layer arranged around the insulating layer; and

a detecting circuit configured to detect earth faults in the rotating field circuit.

38. A machine as claimed in claim 37, wherein:

said cable further comprises a sheath.

39. A machine as claimed in claim 37, further comprising:

an excitation system configured to supply a voltage to a field circuit and configured to rotate with the field circuit; and

an injection and measuring unit for said detecting circuit and being arranged in said excitation system.

40. A machine as claimed in claim 39, wherein:

the detecting circuit comprises

an injection circuit configured to apply an injection voltage on a measuring circuit that is closed through an impedance between field winding and earth,

a measuring unit configured to measure an error current resulting in said measuring circuit from the injection voltage,

A1 Cont.

a rectifier unit arranged to form rectified absolute values of the injection voltage and the error current, and

a wireless communication unit configured to transmit said absolute values to a stationary calculating unit configured to monitor the resistance of the field winding to earth.

41. A machine as claimed in claim 40, wherein:

the excitation system is supplied from an exciter with rotating a stator side, the injection voltage is supplied from the rotating stator side of the exciter.

42. A machine as claimed in claim 41, further comprising:

a filter circuit arranged in said injection and measuring unit to filter away harmonics and to block direct voltages.

43. A machine as claimed in claim 40, further comprising:

a comparator arranged to compare said absolute value of the error current with predetermined limit value and trip an alarm if said absolute value different from said predetermined limit value by a predetermined amount.

44. A machine as claimed in claim 43, further comprising:

a scaling unit arranged prior to the comparator and configured to normalize and compensate the measured error current for variations in the injection voltage before the error current is supplied to the comparator.

45. A machine as claimed in claim 40, further comprising:

measuring means for measuring and transmitting a voltage and current of the field winding to a unit for calculating the rotor temperature.

46. A machine as claimed in claim 45, wherein:

A1 cont.

the unit for calculating the rotor temperature is stationary and in that said measured voltage and current values for the field winding can be transmitted to said calculating unit via the wireless communication unit.

47. A machine as claimed in claim 46, further comprising:

an alarm connected to the unit for calculating which is configured to trip the alarm when a temperature exceeds a predetermined limit value.

48. A machine as claimed in claim 40, further comprising:

a stationary voltage source arranged to supply electricity to the injection circuit via a ring transformer.

49. A machine as claimed in claim 40, wherein:

the injection circuit is supplied from a constant voltage source.

50. A method employed in a rotating electric machine having a rotating field circuit and configured to be directly connected to a distribution or transmission network, wherein at least one electric winding of the machine comprises at least one electric conductor, a first layer with semiconducting properties surrounding the conductor, a solid insulating layer surrounding the first layer, and a second layer with semiconducting properties surrounding the insulating layer, comprising the steps of:

supplying an injection voltage to a measuring circuit that is closed by way of an impedance between a field winding of the rotating electric machine and earth;

measuring a resulting error current in the measuring circuit;

forming rectified absolute values of the injection voltage and the resulting error current;

A1 cont.

transmitting the rectified absolute values to a calculating unit so as to monitor a resistance of the field winding to earth.

51. A method as claimed in claim 50, wherein:

said measuring step includes filtering away harmonics in the measuring circuit.

52. A method as claimed in 50, further comprising a step of:

comparing said absolute values of the error current with predetermined limit values and tripping an alarm when said comparing step provides a result that is greater than a predetermined level.

53. A method as claimed in claim 52, further comprising:

normalizing and compensating for variations in the injection voltage prior to the comparing step.

54. A method employed in a rotating electric machine having a rotating field circuit and configured to be directly connected to a distribution or transmission network, wherein an electric field winding of the machine comprises at least one electric conductor, a first layer with semiconducting properties surrounding the conductor, a solid insulating layer surrounding the first layer, and a second layer with semiconducting properties surrounding the insulating layer, comprising the steps of:

measuring a voltage and a current in the electric field winding;

providing measurement results determined in said measuring step to a processor; and

calculating a rotor temperature from the measurement results.

Sub B2

55. A rotating electric machine having a rotating field circuit, and configured to be directly connected to a distribution or transmission network, comprising:

an electric winding having

Cont'd B6 cont'd.

an electric conductor,

a first semiconducting layer surrounding the conductor,

a solid insulating layer surrounding the first layer, and

a second semiconducting layer surrounding the insulating layer;

means for supplying an injection voltage by way of an impedance between a field winding of the rotating electric machine and earth;

means for measuring a resulting error current from the injection voltage as supplied by said means for supplying;

means for forming rectified absolute values of the injection voltage and the resulting error current; and

means for transmitting the rectified absolute values to a means for monitoring a resistance of the field winding to earth.--

IN THE ABSTRACT OF THE DISCLOSURE

After the last page, please insert the following Abstract of the Disclosure: